

CLAIMS

What is claimed is:

1546D1 1. A combined DVD (Digital Video Disk)/CD (Compact Disk) data processor to
2 process a pulse stream of data from a DVD or a CD, comprising:
3 a PLL (Phase Locked Loop) to receive the pulse stream, to generate a PLL clock;
4 a frame/ID (identification) synchronization detector to latch the pulse stream
5 according to said PLL clock, to generate a symbol clock;
6 a demodulator to EFM+ demodulate the pulse stream according to the symbol clock
7 in a DVD mode, and EFM demodulate the pulse stream according to the symbol clock in a
8 CD mode, to generate demodulated data;
9 a memory to store the demodulated data from said demodulator;
10 an ECC (error checking and correction) demodulator to error-correct the demodulated
11 data stored in said memory according to a predetermined code length and error correction
12 range, the predetermined code length and error correction range having different values in
13 the DVD and CD modes, to generate error corrected data;
14 a descrambler to descramble the error corrected data stored in said memory, in the
15 DVD mode; and
16 a CD audio processor to process the error corrected data stored in said memory, in
17 the CD mode.

1 SUBC1 2. The combined DVD/CD data processor as claimed in claim 1, wherein the
2 predetermined code word and correction range in the DVD mode are PI(182,172),
3 PO(208,192), and the predetermined code word and correction range in the CD mode are
4 C1(32,28), C2(28,24).

1 3. The combined DVD/CD data processor as claimed in claim 2, wherein said
2 ECC demodulator comprises:

3 a syndrome generator to receive said demodulated data from said memory to generate
4 a syndrome polynomial according to said code length and correction range of PI(182,172),
5 PO(208,192) in the DVD mode, and of C1(32,28), C2(28,24) in the CD mode;

6 an erasure constant generator to receive an erasure flag to generate an erasure
7 constant;

8 a modified syndrome calculator to receive the syndrome polynomial and the erasure
9 constant to calculate a modified syndrome and generate a Forney syndrome polynomial and
10 an erasure polynomial;

11 a modified Euclidean algorithm to process the Forney syndrome polynomial and the
12 erasure polynomial based on a modified Euclidean algorithm, to generate an errata locator
13 polynomial and an errata evaluator polynomial; and

14 a Chien search and error correction circuit to correct errors of the demodulated data
15 stored in said memory according to said errata locator polynomial and said errata evaluator
16 polynomial.

17 4. The combined DVD/CD data processor as claimed in claim 1, wherein said
18 memory is an external memory.

19 5. The combined DVD/CD processor as claimed in claim 1, wherein said
20 memory has a first memory map including a plurality of blocks of the error corrected data
21 each having a first fixed number of bytes in the DVD mode, and a second memory map
22 including a plurality of frames of the error corrected data each having a second fixed number
23 of bytes in the CD mode.

24 6. The combined DVD/CD processor as claimed in claim 5, wherein:
25 the plurality of blocks is 13;
26 the first fixed number of bytes is 32.25Kbytes;
27 the plurality of frames is 256; and
28 the second fixed number of bytes is 32bytes.

1 *Sub 21*. A combined DVD (Digital Video Disk)/CD (Compact Disk) data processor to
2 process first and second pulse streams from a DVD and a CD, respectively, comprising:
3 a PLL (Phase Locked Loop) to receive the first and second pulse streams, to
4 generate respective first and second PLL clocks;
5 a frame/ID (identification) synchronization detector to latch the first and second pulse
6 streams according to the respective first and second PLL clocks, to generate respective first
7 and second symbol clocks;
8 a demodulator to perform a first type of demodulation on the first pulse stream
9 according to the first symbol clock to generate first demodulated data of a DVD mode, and a
10 second type of demodulation on the second pulse stream according to the second symbol
11 clock to generate second demodulated data of a CD mode;
12 a memory to store the first and second demodulated data; and
13 an ECC (error checking and correction) demodulator to error correct the first
14 demodulated data stored in said memory in accordance with a first predetermined code length
15 and error correction range and to store the error corrected first demodulated data back in said
16 memory, and to error correct the second demodulated data stored in said memory in
17 accordance with a second predetermined code length and error correction range and to store
18 the error corrected second demodulated data back in said memory.

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Sub 03 10. The combined DVD/CD data processor as claimed in claim 7, wherein said
2 ECE demodulator comprises:

3 a syndrome generator to generate syndrome polynomials from the first and second
4 demodulated data stored in said memory in accordance with the corresponding first and
5 second code lengths and corresponding first and second correction ranges;

6 an erasure constant generator to generate first and second erasure constants from
7 corresponding first and second erasure flags;

8 a modified syndrome calculator to generate first and second Forney syndrome
9 polynomials and first and second erasure polynomials from the corresponding first and
10 second erasure constants and the corresponding syndrome polynomials;

11 a modified Euclidean algorithm to process the first and second Forney syndrome
12 polynomials with the corresponding first and second erasure polynomials, to generate
13 corresponding first and second errata locator polynomials and corresponding first and second
14 errata evaluator polynomials; and

15 a Chien search and error correction unit to correct errors of the first and second
16 demodulated data stored in said memory according to the corresponding first and second
17 errata locator polynomials and the corresponding first and second errata evaluator
18 polynomials.

ET 11. The combined DVD/CD data processor as claimed in claim 7, further
2 comprising:

3 a descrambler to descramble the error corrected first demodulated data stored in said
4 memory for use with an audio/video decoder; and

5 an audio processor to audio process the error corrected second demodulated data
6 stored in said memory.

Sub 04 12. A combined DVD (Digital Video Disk)/CD (Compact Disk) data processor to
process first and second pulse streams from a DVD and a CD, respectively, comprising:

3 a demodulator to demodulate the first and second pulse streams in a DVD mode and a
4 CD mode, respectively, to generate first and second demodulated data, respectively;

5 a memory to store the first and second demodulated data; and

6 an ECC (error checking and correction) demodulator to error correct the first
7 demodulated data stored in said memory in accordance with a first predetermined code length
8 and error correction range in the DVD mode, and to error correct the second demodulated
9 data stored in said memory in accordance with a second predetermined code length and error
10 correction range in the CD mode.

13. The combined DVD/CD data processor as claimed in claim 12, wherein said
1 memory stores the error corrected first demodulated data output from said ECC demodulator
2 in a first memory map, and the error corrected second demodulated data output from said
3 ECC demodulator in a second memory map different from the first memory map.
4

14. The combined DVD/CD data processor as claimed in claim 12, further
comprising:

a descrambler to descramble the error corrected first demodulated data stored in said
memory for use with an audio/video decoder; and

an audio processor to audio process the error corrected second demodulated data
stored in said memory.

15. The combined DVD/CD data processor as claimed in claim 12, further
comprising:

a PLL (Phase Locked Loop) to receive the first and second pulse streams, to
generate respective first and second PLL clocks; and

a frame/ID (identification) synchronization detector to latch the first and second pulse
streams according to the respective first and second PLL clocks, to generate respective first
and second symbol clocks;

wherein said demodulator performs a first type of demodulation on the first pulse
stream according to the first symbol clock to generate the first demodulated data in the DVD
mode, and a second type of demodulation on the second pulse stream according to the second
symbol clock to generate the second demodulated data in the CD mode.

Sub D5

16. A combined DVD (Digital Video Disk)/CD (Compact Disk) data processor to
process first and second pulse streams from a DVD and a CD, respectively, comprising:
a demodulator to demodulate the first and second pulse streams in a DVD mode and a
CD mode, respectively, to generate first and second demodulated data, respectively;
a single external memory to store the first and second demodulated data; and
a single ECC (error checking and correction) demodulator to error correct the first
and second demodulated data stored in said memory.

17. The combined DVD/CD as claimed in claim 16, wherein said single ECC
demodulator error corrects the first and second demodulated data stored in said memory in
accordance with corresponding different code lengths and correction ranges.

18. The combined DVD/CD data processor as claimed in claim 16, further
comprising:
a descrambler to descramble the error corrected first demodulated data for use with an
audio/video decoder; and
an audio processor to audio process the error corrected second demodulated data.

19. The combined DVD/CD data processor as claimed in claim 16, further
comprising:
a PLL (Phase Locked Loop) to receive the first and second pulse streams, to
generate respective first and second PLL clocks; and
a frame/ID (identification) synchronization detector to latch the first and second pulse
streams according to the respective first and second PLL clocks, to generate respective first
and second symbol clocks;
wherein said demodulator performs a first type of demodulation on the first pulse
stream according to the first symbol clock to generate the first demodulated data in a DVD
mode, and a second type of demodulation on the second pulse stream according to the second
symbol clock to generate the second demodulated data in a CD mode.

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